What is claimed is:

- 1. A method for etching an organic anti-reflective coating (OARC), comprising:
- (a) providing a substrate having an organic anti-reflective coating (OARC) thereon:
- (b) forming a patterned mask on the organic anti-reflective coating (OARC); and
- (c) etching the organic anti-reflective coating (OARC) using a gas mixture comprising at least one of a hydrocarbon-containing gas and an oxygen-containing gas.
- 2. The method of claim 1 wherein the oxygen-containing gas is selected from the group consisting of oxygen (O_2) , carbon dioxide (CO_2) , carbon monoxide (CO) and sulfur dioxide (SO_2) .
- 3. The method of claim 1 wherein the hydrocarbon-containing gas has a formula C_xH_y where x and y are integers.
- 4. The method of claim 1 wherein the hydrocarbon-containing gas is selected from the group consisting of methane (CH_4), ethylene (C_2H_4), ethane (C_2H_6) and ethylyne (C_2H_2).
- 5. The method of claim 1 wherein the organic anti-reflective coating (OARC) comprises a material selected from the group consisting of polyamide and polysulfone.
- 6. The method of claim 1 wherein the gas mixture further comprises an inert gas.
- 7. The method of claim 6 wherein the inert gas comprises one or more gases selected from the group consisting of nitrogen (N₂), argon (Ar), helium (He) and neon (Ne).
- 8. The method of claim 6 wherein the gas mixture comprises the hydrocarbon-containing gas and the inert gas at a hydrocarbon-containing gas:inert gas flow ratio

within a range of about 30:1 to about 3:1.

- 9. The method of claim 6 wherein the gas mixture comprises the oxygen-containing gas and the inert gas at an oxygen-containing gas:inert gas flow ratio within a range of about 5:1 to about 1:5.
- 10. The method of claim 6 wherein step (c) further comprises:

providing the hydrocarbon-containing gas and the inert gas at a hydrocarbon-containing gas:inert gas flow ratio of about 20:1 to 3:1;

maintaining the substrate at a temperature of about 10 to about 60 degrees Celsius:

applying a plasma power of about 500 W to about 1200 W; applying a substrate bias power of about 50 W to about 200 W; and maintaining a process chamber pressure within a range of about 1 mTorr to about 30 mTorr.

11. The method of claim 6 wherein step (c) further comprises:

providing the oxygen-containing gas and the inert gas at an oxygen-containing gas:inert gas flow ratio of about 5:1 to 1:5;

maintaining the substrate at a temperature of about 10 to about 60 degrees Celsius;

applying a plasma power of about 500 W to about 1200 W; applying a substrate bias power of about 50 W to about 200 W; and maintaining a process chamber pressure within a range of about 1 mTorr to about 10 mTorr.

- 12. A method of fabricating an integrated circuit, comprising:
- (a) providing a substrate having an organic anti-reflective coating (OARC) formed on one of a metallic layer and a dielectric layer;
- (b) forming a patterned mask on the organic anti-reflective coating (OARC); and
- (c) etching the organic anti-reflective coating (OARC) using a gas mixture comprising at least one of a hydrocarbon-containing gas and an oxygen-containing gas.

- 13. The method of claim 12 wherein the oxygen-containing gas is selected from the group consisting of oxygen (O₂), carbon dioxide (CO₂), carbon monoxide (CO) and sulfur dioxide (SO₂).
- 14. The method of claim 12 wherein the hydrocarbon-containing gas has a formula C_xH_v where x and y are integers.
- 15. The method of claim 12 wherein the hydrocarbon-containing gas is selected from the group consisting of methane (CH_4), ethylene (C_2H_4), ethane (C_2H_6) and ethylyne (C_2H_2).
- 16. The method of claim 12 wherein the organic anti-reflective coating (OARC) comprises a material selected from the group consisting of polyamide and polysulfone.
- 17. The method of claim 12 wherein the gas mixture further comprises an inert gas.
- 18. The method of claim 17 wherein the inert gas comprises one or more gases selected from the group consisting of nitrogen (N₂), argon (Ar), helium (He) and neon (Ne).
- 19. The method of claim 17 wherein the gas mixture comprises the hydrocarbon-containing gas and the inert gas at a hydrocarbon-containing gas:inert gas flow ratio within a range of about 20:1 to about 3:1.
- 20. The method of claim 17 wherein the gas mixture comprises the oxygen-containing gas and the inert gas at an oxygen-containing gas:inert gas flow ratio within a range of about 5:1 to about 1:5.
- 21. The method of claim 12 wherein step (c) provides an etch selectivity for the organic anti-reflective coating (OARC) over the metallic layer of about 20:1.
- 22. The method of claim 12 wherein step (c) provides an etch selectivity for the organic anti-reflective coating (OARC) over the dielectric layer of about 30:1.

23. The method of claim 17 wherein step (c) further comprises:

providing the hydrocarbon-containing gas and the inert gas at a hydrocarbon-containing gas:inert gas flow ratio of about 20:1 to 3:1;

maintaining the substrate at a temperature of about 10 to about 60 degrees Celsius;

applying a plasma power of about 500 W to about 1200 W; applying a substrate bias power of about 50 W to about 200 W; and maintaining a process chamber pressure within a range of about 1 mTorr to about 30 mTorr.

24. The method of claim 17 wherein step (c) further comprises:

providing the oxygen-containing gas and the inert gas at an oxygen-containing gas:inert gas flow ratio of about 5:1 to 1:5;

maintaining the substrate at a temperature of about 10 to about 60 degrees Celsius;

applying a plasma power of about 500 W to about 1200 W; applying a substrate bias power of about 50 W to about 200 W; and maintaining a process chamber pressure within a range of about 1 mTorr to about 10 mTorr.

- 25. A computer-readable medium containing software that when executed by a computer causes a semiconductor wafer processing system to etch an organic anti-reflective coating (OARC) using a method, comprising:
- (a) providing a substrate having an organic anti-reflective coating (OARC) thereon:
- (b) forming a patterned mask on the organic anti-reflective coating (OARC);
- (c) etching the organic anti-reflective coating (OARC) using a gas mixture comprising at least one of a hydrocarbon-containing gas and an oxygen-containing gas.
- 26. The computer-readable medium of claim 25 wherein the oxygen-containing gas is selected from the group consisting of oxygen (O_2) , carbon dioxide (CO_2) , carbon

monoxide (CO) and sulfur dioxide (SO₂).

- 27. The computer-readable medium of claim 25 wherein the hydrocarbon-containing gas has a formula C_xH_y where x and y are integers.
- 28. The computer-readable medium of claim 25 wherein the hydrocarbon-containing gas is selected from the group consisting of methane (CH_4), ethylene (C_2H_4), ethane (C_2H_6) and ethylene (C_2H_2).
- 29. The computer-readable medium of claim 25 wherein the organic anti-reflective coating (OARC) comprises a material selected from the group consisting of polyamide and polysulfone.
- 27. The computer-readable medium of claim 23 wherein the gas mixture further comprises an inert gas.
- 28. The computer-readable medium of claim 27 wherein the inert gas comprises one or more gases selected from the group consisting of nitrogen (N_2) , argon (Ar), helium (He) and neon (Ne).